Documento n° **82870-DS-004**

SCHEDA TECNICA E DIMENSIONAMENTO GRUPPO ELETTROGENO 2500 kVA GBA-2750 EWS

REV.	DATA	DESCRIZIONE	PREPARATO	APPROVATO
00	29-03-2022	Prima Emissione	U. T.	S. D.

DATI GENERALI

Modello			GBA-2750 EWS		
Potenza Continua Data Center (DCP) TIER IV	*ISO8528-1:2018*	**kVA / kW**	**2500**	**2000**	**a cosφ 0.80**
Potenza Prime (PRP)	*ISO8528-1:2018*	kVA / kW	2500	2000	a cosφ 0.80
Potenza Stand-by (ESP)	*ISO8528-1:2018*	kVA / kW	2750	2200	a cosφ 0.80
Limited Time Prime Power (LTP)	*ISO8528-1:2018*	kVA / kW	2500	2000	a cosφ 0.80
Fattore di carico			100%		riferito alla DCP
Classe di prestazione	*ISO8528-5:2005*		**G3**		riferito alla DCP
Tensione		V	400 V trifase + Neutro		
Frequenza		Hz	50		
Condizioni ambientali secondo ISO 8528 :					
Altitudine		m s.l.m.	100		
Temperatura		°C	25		
Umidità relativa		%	60		
Condizioni ambientali di funzionamento **senza derating** :					
Altitudine		m s.l.m.	300		
Temperatura		°C	45		
Umidità relativa		%	85		
Fonte primaria di energia			gasolio tipo autotrazione		
Tipo di generatore elettrico			sincrono		
Norme di riferimento			ISO 8528		

Motore Endotermico	**BAUDOUIN**	**12M 55 G2750**	
Tipo		ciclo diesel 4 tempi	
Numero di cilindri	n°	12	
Disposizione		a "V" di 60°	
Alessaggio	mm	180	
Corsa	mm	215	
Cilindrata	dm^3	65.7	
Velocità nominale	1/min	1500	
Senso di rotazione		CCW	
Velocità media pistone	m/sec	10.75	
Rapporto di compressione		16.5 : 1	
Combustibile		gasolio tipo autotrazione	
P.C.I. combustibile	kJ/kg	42700	valore tipico
Potenze meccaniche :			
- Potenza Continua Data Center (DCP) TIER IV	kW	2200	
- Potenza Prime (PRP)	kW	2200	
- Potenza Stand-by (ESP)	kW	2450	

Consumo gasolio	al 110% di carico	(= ESP)	g/kWh / l/h	198	588	
	al 100% di carico	DCP-PRP	g/kWh / l/h	196.1	513	
	al 75% di carico	DCP-PRP	g/kWh / l/h	194.1	386	
	al 50% di carico	DCP-PRP	g/kWh / l/h	201.1	267	
Consumo olio lubrificante			l / h	1.28		
Portata aria di combustione (25° C)			m^3/min	145		
Temperatura gas di scarico			°C	450		
Portata gas di scarico			m^3/min	489		
Potenza termica raffreddamento motore + olio			kW	948		
Potenza termica raffreddamento intercooler			kW	472		
Potenza termica irraggiata dal motore			kW	288		
Serbatoio gasolio						
Capacità serbatoio giornaliero			litri	1000		
Autonomia serbatoio giornaliero			minuti	> 90		riferito alla DCP

Generatore Sincrono	**MARELLI / STAMFORD**			
Potenza apparente in servizio continuo S1 (cosφ 0.80)		kVA	3000	± 100 kVA
Potenza attiva in servizio continuo S1		kW	2400	
Tensione nominale		V	400	
Corrente nominale		A	4330	
Fattore di potenza nominale		-	0.80	
Frequenza nominale		Hz	50	
Velocità nominale		1/min	1500	
Momento d'inerzia delle parti rotanti		kgm^2	84.1	
Rendimento a pieno carico	a cosφ 0.80		0.963	3000 kVA
Rendimento al 75 % del pieno carico	a cosφ 0.80		0.966	2250 kVA
Rendimento al 50 % del pieno carico	a cosφ 0.80		0.966	1500 kVA
Rendimento al carico nominale GE	a cosφ 0.80		0.964	2500 kVA

CALCOLO E DIMENSIONAMENTO GRUPPO ELETTROGENO PER DATA CENTER

Modello gruppo elettrogeno			**GBA-2750 EWS**	
Motore Endotermico	BAUDOUIN		**12M 55 G2750**	
Generatore elettrico	MARELLI / STAMFORD			
Potenza meccanica Continua Data Center (DCP) TIER IV		kW	2200	pagina 2 / 4
Tolleranza e dichiarata dal costruttore del motore			nessuna	
Potenza max assorbita da elettroradiatore e ventilazione container		kW	80.0	
Potenza netta motore		kW	2120.0	
Rendimento dell'alternatore a 2500 kVA - 400 V - cosφ 0.80			0.964	pagina 3 / 4
Potenza elettrica ai morsetti del generatore		kWe	2044	
Potenza nominale dei due sistemi carica batterie		kWe	1.5	2 x 750 W
Potenza nominale di una elettropompa combustibile		kWe	0.55	
Potenza media assorbita servizi ausiliari del GE		kWe	1.0	
POTENZA UTILE FINALE DEL GRUPPO ELETTROGENO		**kWe**	**2041**	**Maggiore della potenza di 2000 kWe richiesta**
in accordo al rating Potenza Continua Data Center (DCP) secondo ISO8528-1: 2018 e rispondente alle prescrizioni Uptime Institute per Data Center Tier IV		**kVA**	**2551**	**Maggiore della potenza di 2500 kVA richiesta**

ALLEGATI

Allegato 1	Scheda tecnica Motore Diesel BAUDOUIN

Ratings

RPM	Gross Engine Output		Net Engine Output	
	Data Centre Power (DCP)		Data Centre Power (DCP)	
	kWm	BHP	kWm	BHP
1500	2200	2950	2088	2801

1 kWm = 1,34102 BHP

Basic data

Engine model 12M55G2750/5
N° of Cylinders / Valves ..... 12 / 48
Cylinders arrangement ..... At Vee
Bore x Stroke (mm) ..... 180 x 215
Displacement (L) 65.65
Thermodynamic Cycle ..... Diesel 4 stroke
Mean Piston Speed (m/s) 10.75
BMEP (Bar) 29.9
Cooling System ..... Liquid (water + 50% antifreeze)
Injection System ..... Direct
Fuel System ..... High Pressure Common Rail
Aspiration ..... Turbocharged and Aftercooled
Compression ratio ..... 16.5 : 1
Flywheel housing ..... SAE 00
Flywheel ..... 21"
N° of teeth on flywheel ring gear 202
Inertia of flywheel (kg•m²) 20.78
Inertia of crankshaft (kg•m²) 16.16
Emission standard ..... N/A
Overall Dimensions without radiator (Length x Width x Height) (mm) ..... 4193 x 2241 x 2787
Engine dry weight without radiator and without radiator pipes (kg) 9550
Engine dry weight with radiator and radiator pipes (kg) 11500
Engine wet weight with radiator (includes oil, coolant) (kg) 12610

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Air intake system

Air intake temperature rise (°C) ..... ≤ 5
Air intake restriction clean filter (mBar) ..... ≤ 30
Air intake restriction dirty filter (mBar) ..... ≤ 70
Recommended air flow @ DCP (m³/min) 144.6
Min. diameter of intake pipe (mm) 250

Aftercooling system

Aftercooler system type .....Air to Water
Max. intake temperature @ 25°C ambient temperature (°C) 55
Max. difference between intake temperature and ambient temperature (°C) ..... TBD
Max. intake pressure drop of aftercooler (mBar)..... 50

Lubrication system

Oil capacity Low / High (L) ..... 380 / 480
Oil pressure in normal condition idle speed (Bar) ..... ≥ 1.8
Oil pressure in normal condition at 1500 Rpm @ DCP (Bar) ..... 4 - 6.5
Lowest oil pressure alarm (shutdown) (Bar) 1.8
Max. oil temperature (°C) 105
Oil flow at 1500 Rpm (L/min) 1080
Oil fuel consumption ratio based on engine fuel consumption data ..... ≤ 0.4g/kW·h
Total system capacity (including filters) (L)..... 560

Heat balance test data (with ambient temperature 42.4 °C)

Total heat dissipation @ DCP (kJ/s) 3539.8
- Heat Rejection to Jacket Water @ DCP (kJ/s) 947.9
- Heat Rejection to AfterCooler @ DCP (kJ/s) 471.6
- Radiated Heat to Ambient @ DCP (kJ/s) 288.3
- Heat Rejected to Exhaust @ DCP (kJ/s) 1832

Exhaust system

Max. exhaust back pressure (mBar) 150
Max. exhaust temperature before turbocharger (°C) 740
Max. exhaust temperature after turbocharger (°C) ..... TBD
Exhaust flow @ DCP (m³/min) 488.7
Min. diameter of exhaust pipe (mm) 280
Max. bending moment of exhaust gas exit flange (Nm) 10

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Cooling system with Made in EU radiator

System designed for ambient temperature up to (°C) [1] 50
Radiator type ..... Electrical
Fan type ..... Electric driven pusher - 4 x 30 kWe 400 Vac 1450 Rpm motors
Min. inside diameter of coolant outlet pipe (mm) 96
Coolant capacity of radiator and pipes (L) 270
Coolant alarm (shutdown) temperature (°C) 110
Thermostat opening temperature / full open temperature (°C) ..... 78 / 90
Max. additional restriction for external cooling circuit (Bar) ..... TBD
Coolant capacity of the engine (L) 306
Cooling fan airflow (m³/min) 2400
Fan absorbed power (kW) 110
Additional restriction (for reference) - Duct allowance (Pa) 150

Fuel system

Governor ..... ECU
Governor steady state speed stability at constant load (ISO 8528-5 Class G3) [2] ..... ≤ +/- 0.5 %
Max. restriction at fuel inlet (Bar) 0.1
Max. pressure at fuel inlet (Bar) 0.5
Max. fuel return restriction (Bar) 0.2
Max. fuel inlet temperature (°C) 50
Fuel supply flow (L/hr) 2800
Min. internal diameter of inlet pipe (mm) 19
Min. internal diameter of return pipe (mm) 19

Electrical system

Electrical system voltage (negative to ground) (Vdc) 24
Starter power (kW) ..... 2 x 8.5
Battery charger current (A) 55
Battery charger absorbed power (kW) 1,6
Max. electric resistance of starting circuit (Ω) 0.008
Min. sectional area of wire (mm²) ..... 2 x 95
Min. cold start temperature without auxiliary starting device (°C) [3] ..... -10
Min. cold start temperature with auxiliary starting device (°C) [3] ..... TBD

[1] The indicated value is based on the AOT value of 50°C for an engine tested at 100% of the DCP Power, reflecting temperature in an open condition, without an enclosure or container, without any airflow obstruction in the front of the radiator, without air recirculation, with free exhaust gas exit and with the engine thermostatic valve in its full open condition, without a closing plate present. The reference air restriction is equal to 50Pa. For the equivalent ATB (Air-to-Boil) performance in a customer or project basis, please consult Baudouin Application Engineering.

[2] This refers only to the frequency response of the engine and should not be confused with the performance class of the Generator Set, which is subject to additional contributing factors such as alternator selection and control settings.

[3] Engines used in emergency standby application or applications that require immediate start under load, they must be equipped with coolant heaters. Baudouin recommend heaters installation to be executed by providing constant coolant circulation across all the engine components. Two heaters are required for V-type engines, one per each side.

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Noise

Diesel engine noise (Acoustic power level) (dB(A)) 123.8
Noise - upper side (dB(A)) 107
Noise - right side (view from flywheel) (dB(A)) 106,2
Noise - left side (view from flywheel) (dB(A)) 106,3
Noise – front (radiator) side (dB(A)) 106,2
Noise – rear (flywheel) side (dB(A)) 105,4

Notes :

a) Noise test made at 100% of the power, at 1 mt. distance, on engine without radiator, without cooling fan and without silencer.
b) Noise test refers to GB/T 1859 norm : “Reciprocating internal combustion engines. Measurement of emitted airborne noise. Engineering method and survey method”.

Fuel consumption

Rating	gr/kWh	L/hr
100% DCP	196.1	513.9
75% DCP	194.1	393.2
50% DCP	201.1	263.5
25% DCP	219.4	164.3
	Fuel consumption tolerance + 3 %	

Ratings definitions

Data Centre Power (DCP)

Data Centre Power is defined as being the maximum power which a generating set is capable of delivering while supplying a variable or continuous electrical load and during unlimited run hours. Depending on the sites to supply and the availability of reliable utility, the generating set manufacturer is responsible to define what power level he is able to supply to fulfil that requirement including hardware or software or maintenance plan adaptation.

Note : The engine driven alternating current generating set is a reliable source of power for the data centre and it can be also used to back up a reliable utility. Prolonged operation at load in parallel with a utility is not permitted.

Uptime Compliant

This engine rating is compliant with Uptime certified installations

1) All ratings are based on operating conditions under ISO 8528-1:2018, ISO 3046, DIN6271. Performance tolerance of ±5%.
2) Test conditions : 100 kPa, 25°C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L. Derating may be required for conditions outside these; please contact the factory for details.
3) Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan and optional equipment.

Firmato digitalmente da:
ROBERTO BACCINI
Noovle S.p.A.
Firmato il 26/08/2025 18:40
Seriale Certificato: 2346
Valido dal 23/07/2024 al 23/07/2027
TI Trust Technologies QTSP CA

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